ISTANBUL MEDIPOL UNIVERSITY
SYLLABUS
Artificial Intelligence in Medicine - II
2023 Fall Semester

Course Code	Course Name	Course Type	Weekly T	Weekly A	Weekly L	Credits	ECTS	Weekly Class Schedule
COE314963	Artificial Intelligence in Medicine II	Selective	2	0	0	3	4	
Prerequisite	Artificial Intelligence in Medicine I	Prerequisite to						

Lecturer	Prof. Dr. Selim Akyokuş	Office Hours Schedule	TBA
E-mail	sakyokus@medipol.edu.tr		
Phone		Office / Room No	TBA
Assistants			
E-mail			

Course Objectives

This course provides an in-depth exploration of the applications, challenges, and future directions of Artificial Intelligence (AI) in the field of medicine. Students will learn the fundamentals of AI, machine learning, and data science, and how these technologies are transforming healthcare, from diagnostics to treatment planning and patient care. Students will learn about various AI techniques and their implemention in medical practice and in their medical education. The course will provide applications that will include AI in diagnosticis, treatment, patient care, and image/data analysis. The course combines theoretical concepts with practical case studies and hands-on exercises/projects.

Textbook

There are no required textbooks for this course. Reference and reading materials will be provided via the course professor via Microsoft Teams.

Learning Outcomes

After successful completion of the course, the student will be able to:

1	Understand the fundamental concepts of AI and machine learning.
2	Analyze the role of AI in various medical fields, including diagnostics, imaging, personalized medicine, and drug discovery.
3	Learn and apply AI models to solve specific problems in medicine.
4	Gain hands-on experience with AI tools and platforms through practical exercises and projects.
5	Stay informed about the latest advancements, research studies, and trends in AI and healthcare.

Teaching Methods

Lectures and discussions in class. Homeworks and team project assignments, final exam.

WEEK	TOPIC	REFERENCE
Week 1	Introduction to AI Methods and their Applications in Medicine	Lecture Notes 1
Week 2	Machine Learning Basics	Lecture Notes 2
Week 3	Data Collection and Preprocessing	Lecture Notes 3
Week 4	Supervised Learning	Lecture Notes 4
Week 5	Unsupervised Learning	Lecture Notes 5
Week 6	Model Evaluation and Performance Metrics	Lecture Notes 6
Week 7	Deep Learning in Medicine	Lecture Notes 7
Week 8	Medical Imaging and AI	Lecture Notes 8
Week 9	Natural Language Processing (NLP) in Healthcare	Lecture Notes 9
Week 10	AI in Diagnostics and Disease Prediction	Lecture Notes 10
Week 11	AI in Personalized Medicine, Treatment Planning, Drug Discovery	Lecture Notes 11
Week 12	AI in Medical Robotics and Genomics	Lecture Notes 12
Week 13	Challenges and Limitations of AI in Medicine, and Future Trends	Lecture Notes 13
Week 14	Course Review and Project Presentations	Lecture Notes 14

Assessment Methods and Criteria

Evaluation Tool	Quantity	Weight
Final Exam	1	30%
Midterm	1	25%
Homeworks	2	10%
Presentation	1	5%
Group project	1	30%

*** ECTS Credit Calculation ***

Language of Instruction: English

Activity	Hours	Weeks	Student Workload Hours	Activity	Hours	Weeks	Student Workload Hours
Lecture hours	3	14	42.0	Midterm exam study	10	1	10.0
Homeworks/project	4	6	24.0	Final exam study	10	1	10.0
Home study	2	12	24.0				0.0
				Total Workload Hours =			110.0
				Recommended ECTS Credit =			4